ORDER NO. HAD85032436C9

Service Manual

Automatic Turntable System

Turntable System

SL-BD2

Color

(S)	Silver Type
(K)	Black Type

Color	Area
(S), (K)	[E] .....Switzerland and Scandinavia
(S), (K)	[EK] .....United Kingdom
(S), (K)	[XL] .....Australia
(S), (K)	[EG] .....F.R. Germany
(S), (K)	[EB] .....Belgium
(S), (K)	[EH] .....Holland
(S), (K)	[EF] .....France
(S), (K)	[Ei] .....Italy
(S), (K)	[EC] .....Czechoslovakia
(S), (K)	[XA] .....Southeast Asia, Oceania, Africa, Middle Near East and Central South America
(S), (K)	[PA] .....Far East PX
(S), (K)	[PE] .....European Military
(S), (K)	[PC] .....European Audio Club

T4P is the standard mark for the "P-mount" plug-in-connector system. Products carrying this mark are interchangeable and compatible with each other.

SPECIFICATIONS

■ Turntable section

Type: Semi-automatic turntable
Features: Auto return
Auto stop
Drive method: Belt drive
Motor: DC motor
Drive control method: Frequency generator servo control
Turntable platter: Aluminum die-cast
Diameter 31.2 cm
Turntable speeds: 33-1/3 rpm and 45 rpm
Wow and flutter: 0.045% WRMS (JIS C5521)
±0.06% peak
(IEC 98A Weighted)
Rumble: −70 dB (IEC 98A Weighted)

■ Tonearm section

Type: Statically balanced straight tonearm
Plug-in connector cartridge system
Effective length: 230 mm
Overhang: 15 mm
Tracking error angle: Within 2°32' at the outer groove of 30 cm record
Within 0°32' at the inner groove of 30 cm record
Effective mass: 13.5 g (including cartridge)
Stylus pressure: 1.25 g (Fixed)
Applicable cartridge weight: 6 g
Phono cable capacitance: 90 pF

■ Cartridge section

Type: Moving magnet stereo cartridge
Magnetic circuit: All laminated core
Frequency response: 10 Hz ~ 35 kHz
Output voltage: 2.5 mV at 1 kHz, 5 cm/s. zero to peak lateral velocity
(7 mV at 1 kHz, 10 cm/s. zero to peak 45° velocity [DIN 45 500])
Channel separation: 22 dB at 1 kHz
Channel balance: Within 2 dB at 1 kHz
Recommended load impedance: 47 kΩ~100 kΩ
Compliance (dynamic): 12×10^{-6}cm/dyne at 100 Hz
Stylus pressure range: 1.25±0.25 g (12.5±2.5 mN)
Weight: 6 g (cartridge only)
Replacement stylus: EPS-30CS

Technics

Panasonic Tokyo Office
Matsushita Electric Trading Co., Ltd.
1-2, 1-chome, Shibakoen, Minato-ku, Tokyo 105 Japan

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

SL-BD2

■ General

Power supply: For United kingdom and Australia: 240V, AC 50 Hz
For continental Europe: 220V, AC 50 Hz
For others: ~110—127/220—240V, AC 50/60 Hz

Power consumption: 3 W

Dimensions: (W×H×D) 43 × 9.3 × 37.5 cm
Maximum height when dust cover is open.
43 × 36 × 41 cm

Weight: 3.6 kg (7.9 lb.)

Specifications are subject to change without notice for further improvement.
Weight and dimensions shown are approximate.

■ CONTENTS

	Page
SAFETY PRECAUTION	2
LOCATION OF CONTROLS	3
DISASSEMBLY INSTRUCTIONS	3 ~ 5
MEASUREMENTS AND ADJUSTMENTS	6
SCHEMATIC DIAGRAM	7, 8
BLOCK DIAGRAM	7
CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM	9
TROUBLESHOOTING	9, 10
OPERATIONAL DESCRIPTION OF MECHANISM	11
EXPLODED VIEW	12 ~ 14
REPLACEMENT PARTS LIST	15, 16

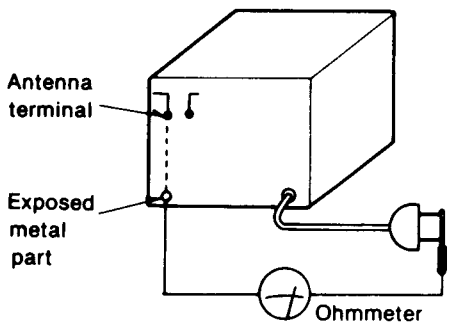
■ SAFETY PRECAUTION (This "safety precaution" is applied only in U.S.A.)

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

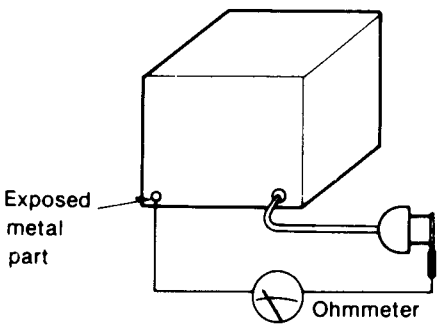
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ

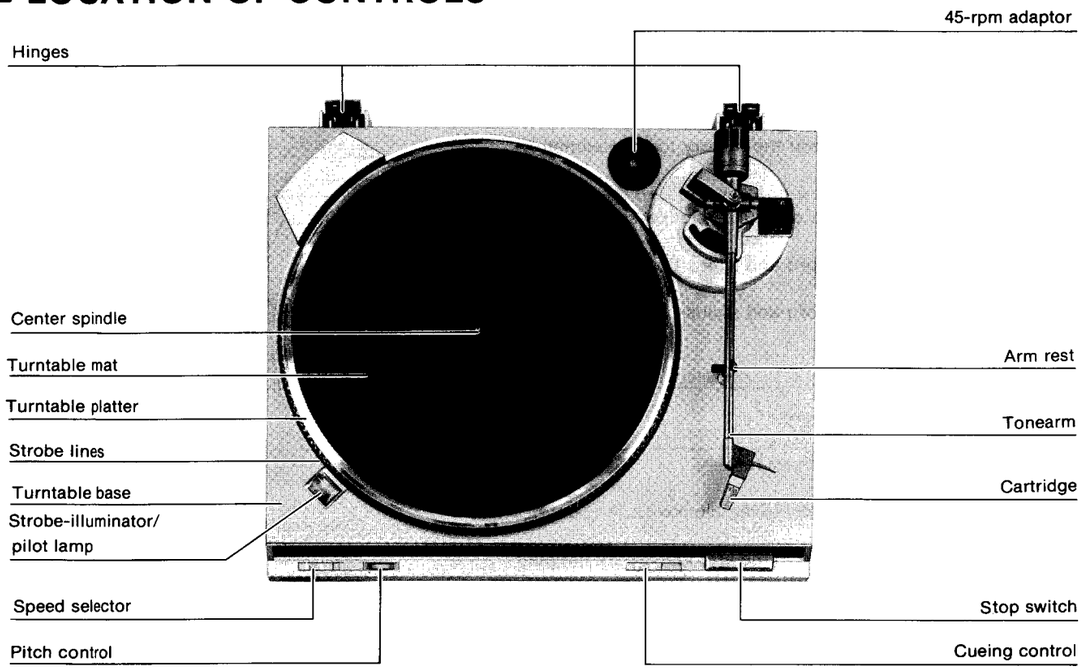


(Fig. B)

Resistance = Approx ∞

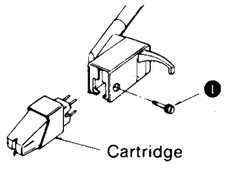
4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

■ LOCATION OF CONTROLS

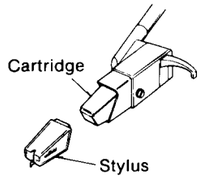


■ DISASSEMBLY INSTRUCTIONS

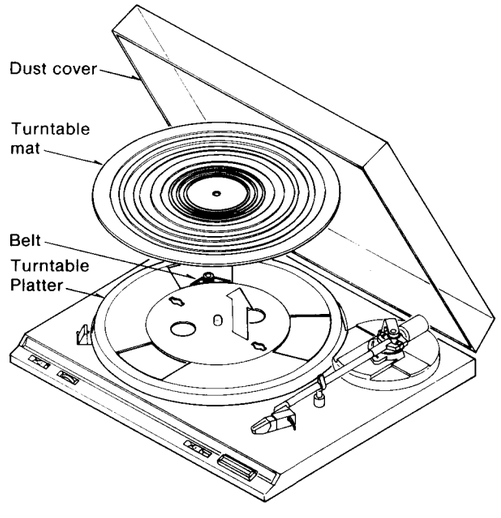
Ref. No 1	How to remove the cartridge
Procedure 1	1. Remove the setscrew ❶. 2. Pull out the cartridge, taking care that your hand does not touch the stylus tip.



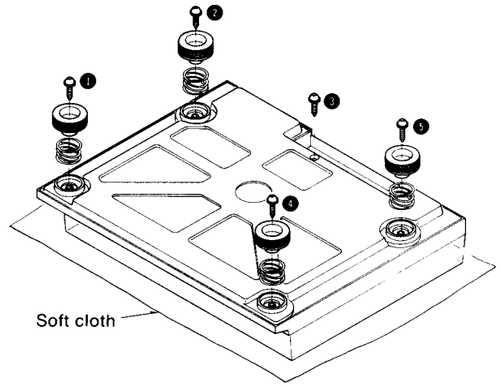
Ref. No 2	How to remove the stylus
Procedure 2	• Pull out the stylus, taking care not to touch the stylus tip.



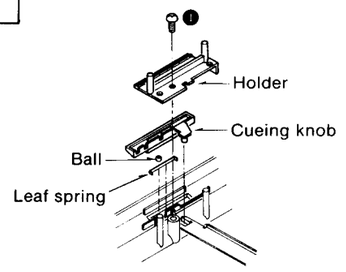
Ref. No 3	How to remove the turntable platter
Procedure 3	1. Open the dust cover and remove the turntable mat. 2. Remove the belt 3. Lift up the turntable platter.



Ref. No 4	How to remove the bottom board
Procedure 3 ➧ 4	1. Turn over the unit on a soft cloth. 2. Remove the 5 setscrews (❶ ~ ❺)

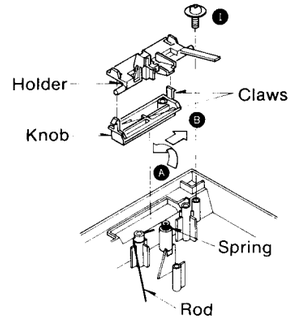


Ref. No 5	How to remove the cueing knob
Procedure 3 ➧ 4 ➧ 5	• Remove the setscrew ❶.



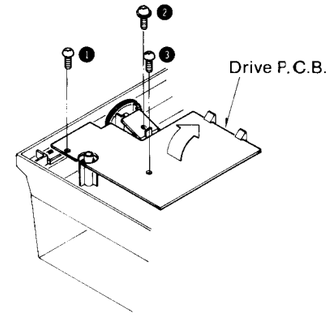
Caution:
When removing the cueing knob, please note the ball bearing which is held between the leaf spring and knob and take care not to drop or lose it.

Ref. No 6	How to remove the stop switch knob
Procedure 3 ➧ 4 ➧ 6	1. Remove the setscrew ❶. 2. Remove the holder (with knob) in the direction of the arrows (Ⓐ, Ⓑ). 3. Release the 2 claws.

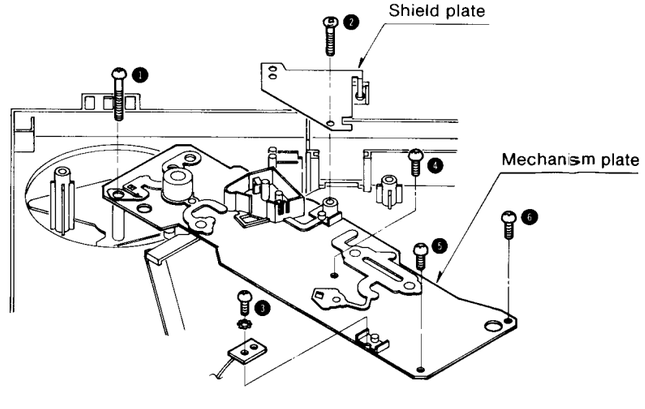


Note:
When attaching the stop knob, do not forget to attach the spring.

Ref. No 7	How to remove the drive P.C.B.
Procedure 3 ➧ 4 ➧ 7	1. Remove the 3 setscrews (❶ ~ ❸). 2. Remove the drive P.C.B. in the direction of the arrow.



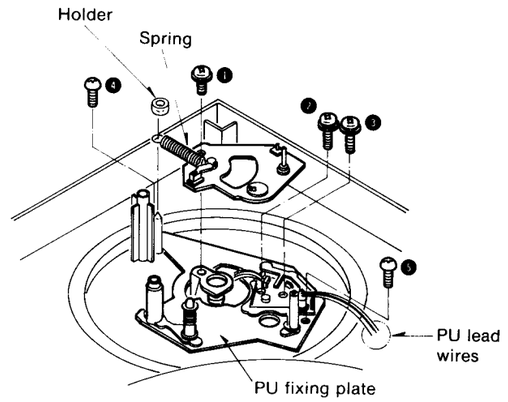
Ref. No 8	How to remove the mechanism plate
Procedure 3 ➧ 4 ➧ 8	1. Remove the 6 setscrews (❶ ~ ❻). 2. Lift up the mechanism plate.



Ref. No 9	How to remove the tonearm and PU fixing plate
Procedure 3➧4➧8➧9	

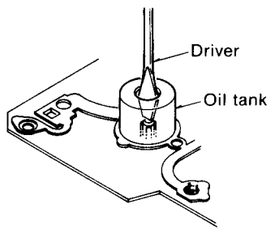
1. Unsolder the 5 PU lead wires from the phono terminal.
2. Remove the spring holder.
3. Remove the setscrew ❶.
4. To remove the tonearm, remove the 2 setscrews (❷, ❸).
5. To remove the PU fixing plate, remove the 2 setscrews (❹, ❺).

* PU lead wiring method
White .....L channel (+) terminal
Blue.....L channel (−) terminal
Red .....R channel (+) terminal
Green .....R channel (−) terminal
Black.....Ground terminal

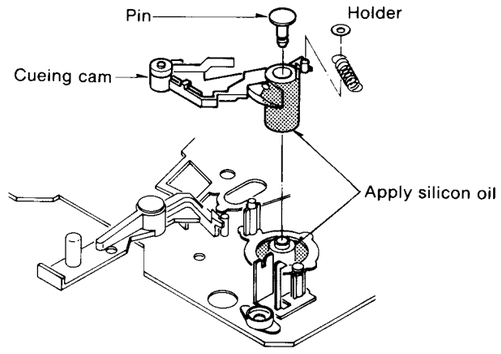


Ref. No 10	How to remove the cueing cam
Procedure 3➧4➧8➧10	

1. Push the pin with a driver.
2. Remove the pin and spring holder.
3. Remove the cueing cam.

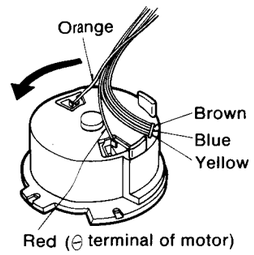


Note:
If the cueing time of the tonearm becomes too short, or if the cueing cam is replaced, apply silicon oil (Part No. SZZ0L12) according to the following procedure.
1. Remove the cueing cam.
2. Apply silicon oil to the cueing cam and oil tank.

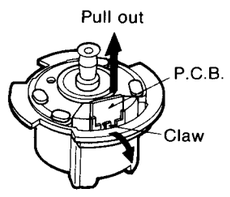


Ref. No 11	How to remove the magnetic resistor element
Procedure 3➧4➧11	

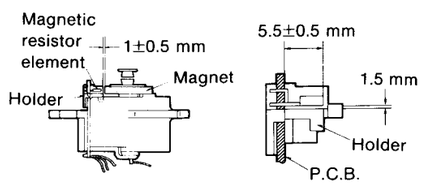
1. Remove the motor assembly in the direction of the arrow.
2. Unsolder the 3 lead wires from the magnetic resistor P.C.B.



1. Release the claw and pull out the P.C.B.
2. Unsolder the 3 terminals of the magnetic resistor element.



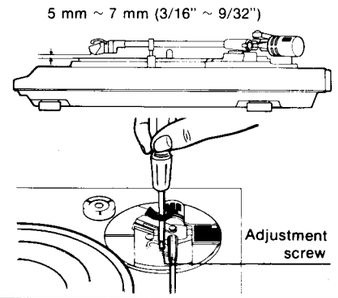
Note:
If the magnetic resistor element has been replaced, observe the following mounting precaution.
- The magnetic resistor element is supplied with the center lead bent. Be sure the seat the bent lead flush to the P.C.B.
- This will ensure the proper clearance (1±0.5mm) between the magnet and the magnetic resistor element as shown below.



■ MEASUREMENTS AND ADJUSTMENTS

• Arm-lift height adjustment

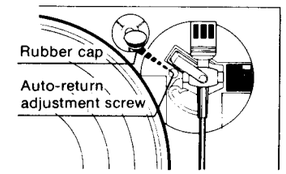
The arm-lift height (distance between the stylus tip and the record surface when the cueing control is at the "▽" position) has been adjusted at the factory to approximately 5 to 7 mm (3/16"—9/32").
If the clearance is too narrow or too wide, turn the adjustment screw clockwise or counterclockwise.
Clockwise rotation
—distance between the record and stylus tip is decreased.
Counterclockwise rotation
—distance between the record and stylus tip is increased.



• Automatic return adjustment

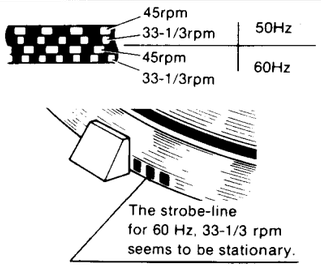
1. Clamp the tonearm to the arm rest.
2. Remove the rubber cap.
3. Turn the screw with a screwdriver, clockwise or counter-clockwise as necessary.

If the tonearm tends to return to the arm rest before the play has finished,
—turn counterclockwise.
If the tonearm fails to return after the final groove,
—turn clockwise.



• Speed adjustment (pitch control)

There are strobe-lines cut on this turntable platter to indicate correct rotational speed.
If the strobe-line appears to be moving as the turntable rotates, adjust while playing a record.
1. Set the speed selector to the speed to be adjusted.
2. Push the power switch. The strobe-illuminator/pilot lamp will light up and the platter will rotate.
3. Watch the dot pattern on the side of the platter. Turn the pitch control one way or the other until the dots appear to stand still. This is the correct speed.
4. Turning the pitch control in the "+" direction increases the speed.
5. Turning the pitch control in the "−" direction decreases the speed.

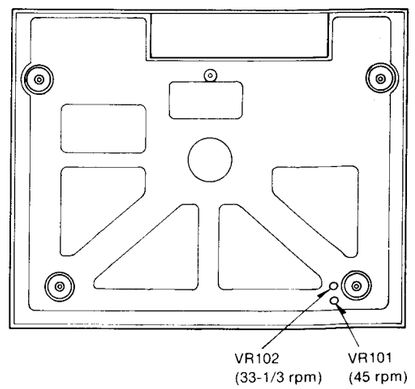


In the U.S.A. and CANADA use 60 Hz lines.
The 50 Hz lines are for European countries.

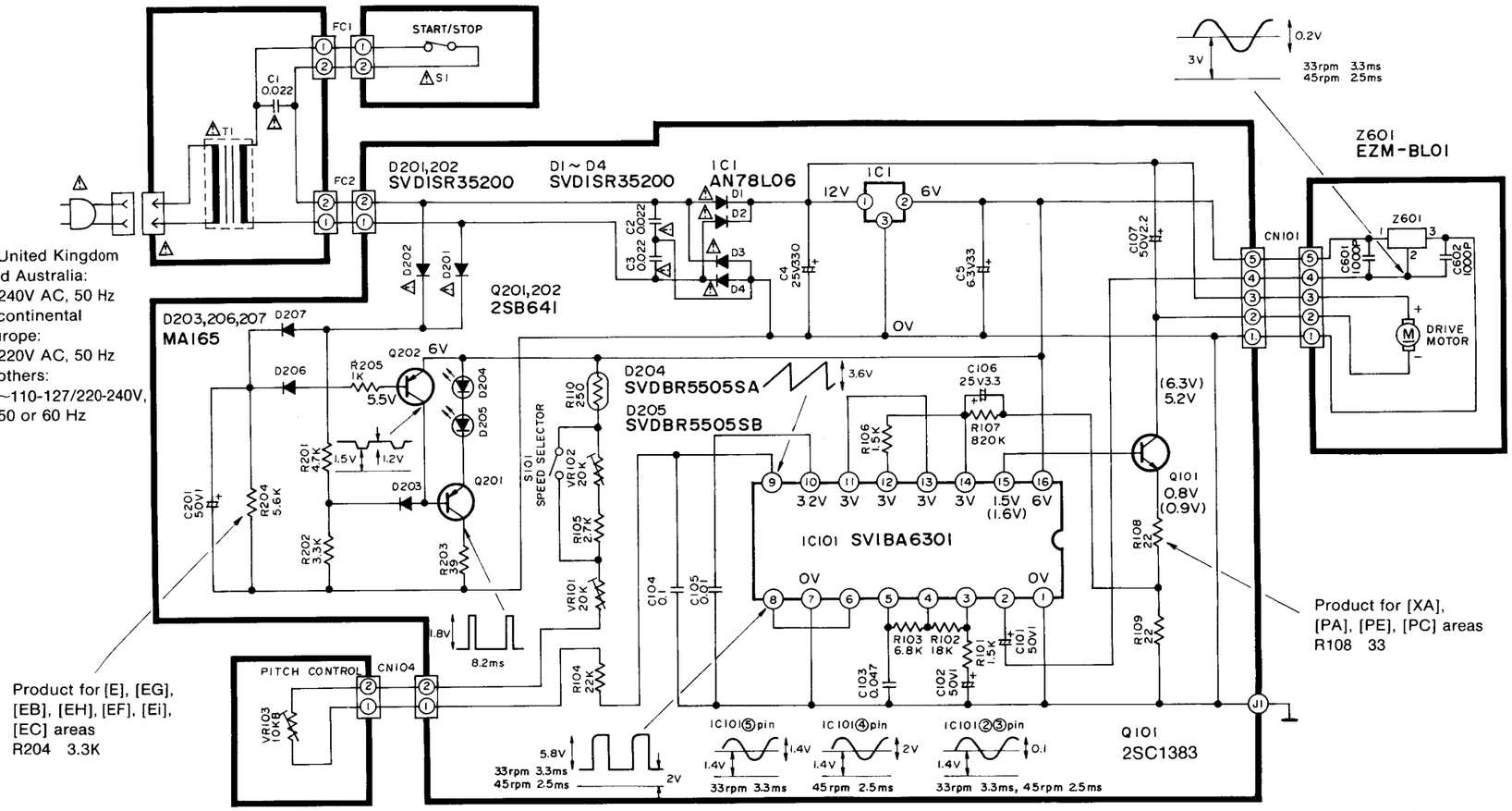
• Rotating speed

When the turntable drive/control IC (IC101) or the variable resistors (VR101, 102) are changed, or if the rated rotation is not reached even when the pitch control knob is turned, adjust the rotating speed in the following procedure.
1. Set the speed selector switch to the "45" position.
2. Turn VR101 with a screwdriver from the bottom of the set to the rated rotation (45 rpm) and check the rotation with a strobe while adjusting the speed.
3. Set the speed selector switch to the "33" position.
4. Turn VR102 with a screwdriver from the bottom of the set to the rated rotation (33-1/3 rpm) and check the rotation with a strobe while adjusting the speed.

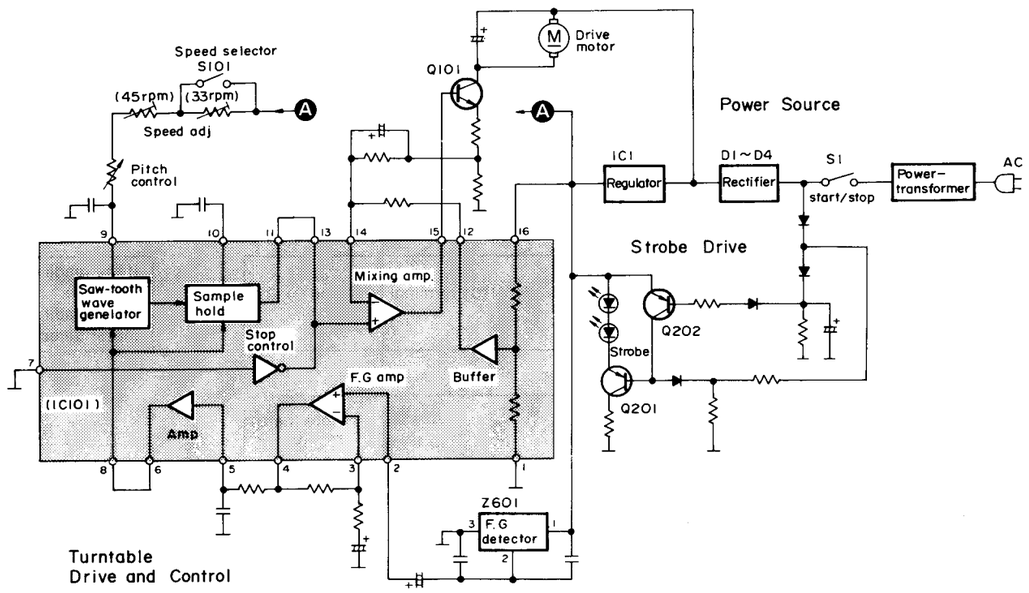
Note: Be sure to make the adjustment for 45 rpm first.



■ SCHEMATIC DIAGRAM (This schematic diagram may be modified at any time with development of new technology.)



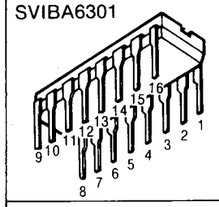
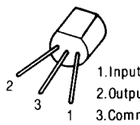
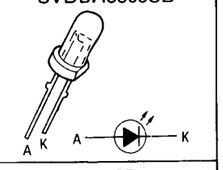
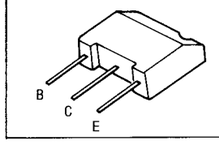
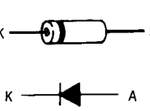
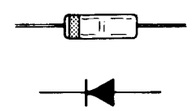
■ BLOCK DIAGRAM



Notes:

1. S1: Power switch in "on" position.
2. S101: Speed selector switch in "33" position.
3. The values are of the reference voltage for the turntable rotation (33 rpm) of this unit, measured by a DC voltmeter (high impedance) on the basis of chassis. So, some error might be included depending on the internal impedance of the measuring instrument and the unit measured.
   * ( ): voltage in 45 rpm.
4. Important safety notice:
   Components identified by a ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
5. VR101 is the 45 rpm speed adjustment variable resistor.
6. VR102 is the 33-1/3 rpm speed adjustment variable resistor.
7. This schematic diagram may be modified at any time with the development of new technology.

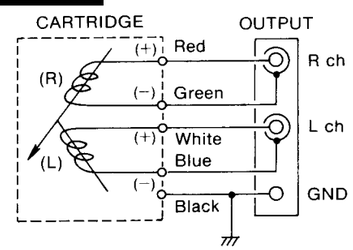
- **Terminal guide of IC's, transistors and diodes**

SVIBA6301 	AN78L06 	SVDBR5505SA SVDBR5505SB 
2SD638 2SB641 	SVD1SR35200V 	MA165 

Caution!

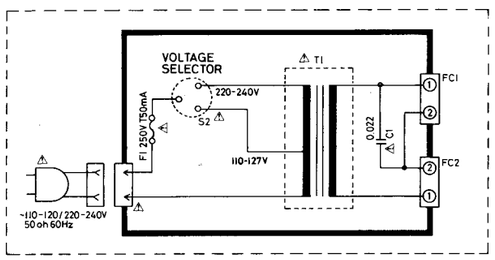
IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

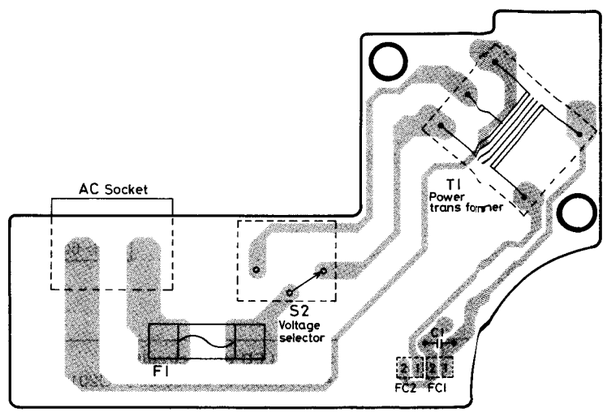
- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the legs of IC or LSI with the fingers directly.



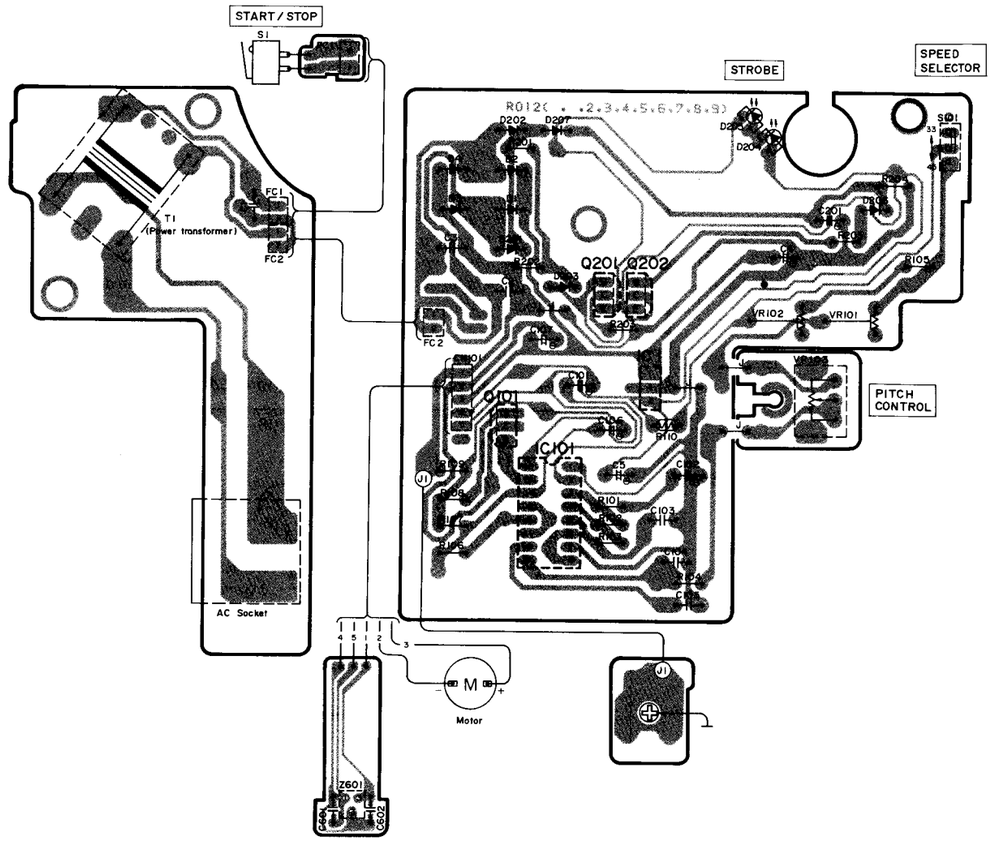
- **Power source circuit**

For [XA], [PA], [PE], [PC] areas





■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM



■ TROUBLESHOOTING

No sound comes out.
→ Check the resistance at output pin plug (left and right channels).
- 0~ a few ohms → Check if shorted circuit at pin plug or lug terminal or connector or cartridge.
- ∞ (open) → Check if opened circuit at pin plug or lug terminal or connector or cartridge.
- 500~600Ω → Check if sequently connected to amplifier or check amplifier.

Strobe LED does not indicate.
→ **Strobe LED drive circuit**
•Waveform of collector of Q201

→ Q201, 202 (Drive transistor), D201~D206, R201~R205 } defective

Turntable does not rotate.
→ AC power plug is connected?
- No → Connect the AC power plug to an AC wall socket.
- Yes → Belt is set over the turntable capstan?
  - No → Set the belt correctly.
  - Yes → **Power source circuit**
    1. AC 14V between FC1 terminals ② and ③.
    2. DC voltage of regulator IC (IC1)
       ① 12V ② 6V ③ 0V
    3. DC voltage at terminal ⑫ of IC101 (3V).

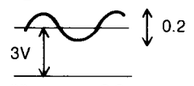
    → T1 (Power transformer), S1 (Power switch), D1~D4 (Rectifier diode), IC1 (Regulator IC), IC101 (Drive IC) } defective

    → **Drive circuit**
    •DC voltage of drive transistor (Q101)

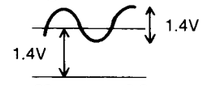
	Base	Collector	Emitter
33 rpm	1.5V	6.3V	0.8V
45 rpm	1.6V	5.2V	0.9V

    → IC101 (Drive IC), Q101 (Drive transistor), Motor, R108,109 (Resistor) } defective

Unstable rotation
→ **FG amplifier circuit**
1. Waveform of terminal ④ of CN101

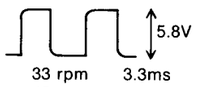


2. Waveform of terminal ⑤ of IC101

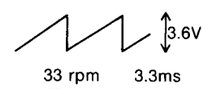


→ Z601 (Magnetic resistor element), IC101 (Control IC), R101~R103, C101~C103, Motor } defective

→ **Control circuit**
1. Waveform of terminal ⑧ of IC101



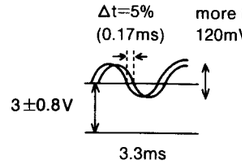
2. Waveform of terminal ⑨ of IC101



→ IC101 (Control IC) defective

Turntable rotates too fast or does not rotate.
→ 1. Conduction check of CN101 terminal of ④ and ⑤, ① and ④.
- ∞ → If the reading is ∞, then Z601 defective.
- 1.3kΩ → If the reading is 1.3kΩ, then motor defective.

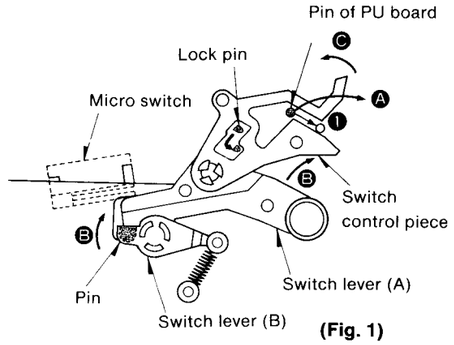
→ 1. Waveform of terminal of CN101.



→ Refer to precaution on page 5.

■ OPERATIONAL DESCRIPTION OF MECHANISM

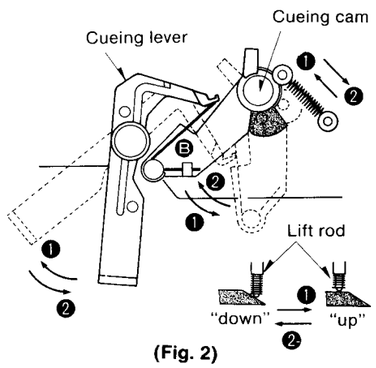
- **Manual start (Fig. 1)**
  1. Shift the tonearm to the turntable side.
     •The PU board rotates and the pin of PU board applies a force to the switch control piece in the direction of arrow Ⓐ.
  2. The switch control piece, switch levers (A) and (B) move in the direction of arrow Ⓑ.
  3. The pin of switch lever (B) holds the contact of microswitch (power).
     •Drive circuit power supply turns ON and motor starts operating.
  4. When the pin of PU board moves to point ❶, the switch control piece moves in the direction of arrow Ⓒ, and the switch control piece is locked by the lock pin of the mechanism board.
     •Microswitch keeps turning ON.



(Fig. 1)

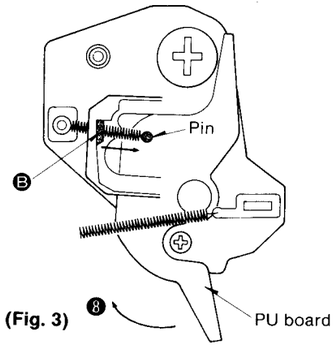
- **Cueing up/down (Fig. 2)**
  1. When the cueing knob is set to up/down position, the cueing lever and cueing cam rotate via the cueing rod.
     •Rotation in the direction of arrow ❶: Cueing up
     •Rotation in the direction of arrow ❷: Cueing down
  2. The lift rod is pushed up or down by the cueing cam operation.

Note:
The cueing cam takes about 6~8 sec. to move from point Ⓐ to point Ⓑ. (Cueing up to cueing down)

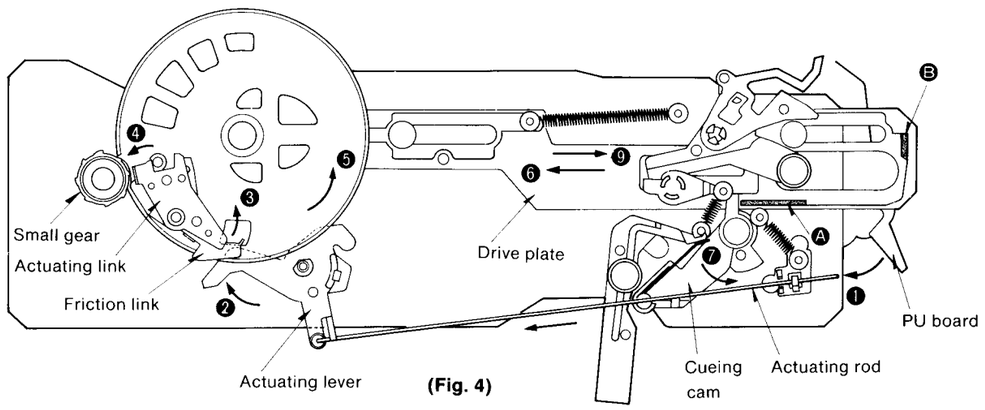


(Fig. 2)

- **Auto return (Fig. 3, 4)**
  1. Tonearm moves to the center of turntable.
     •PU board rotates to hold the actuating rod. (Arrow ❶)
  2. Actuating lever rotates. (Arrow ❷)
     •Friction link and actuating link are pushed out (direcstion ❸ and ❹), then small gear engages with main gear to rotate the latter.
  3. Main gear rotation causes the drive plate to move in the direction of arrow ❻.
     •The projection Ⓐ of drive plate pushes the cueing cam to rotate it for cueing up.
     •The projection Ⓑ of drive plate touches the pin of PU board to rotate it in the direction of arrow ❽, thereby shifting the tonearm back to the rest position.
  4. As the main gear rotates further, drive plate moves in the direction of arrow ❾, thereby resetting the mechanism.



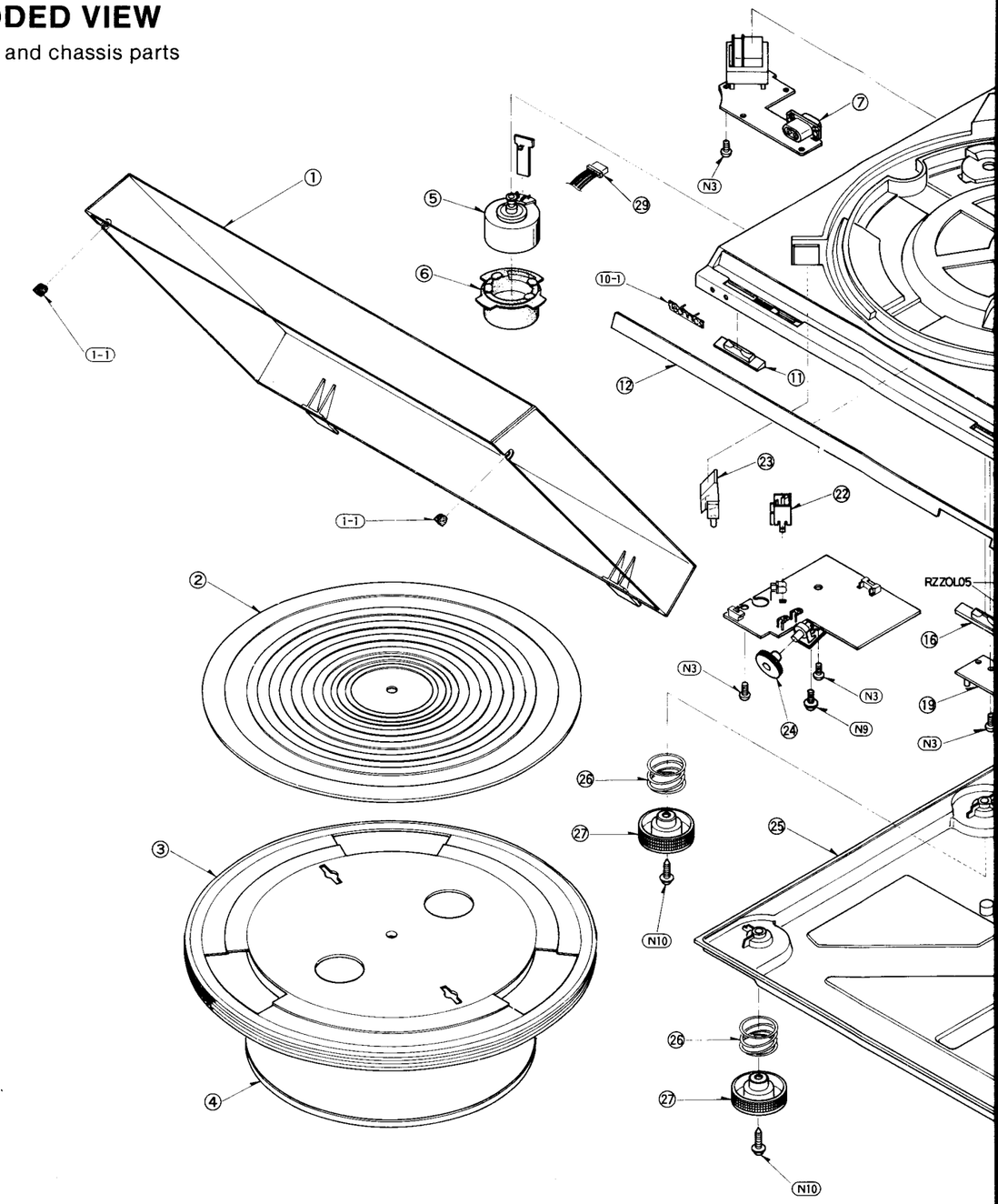
(Fig. 3)



(Fig. 4)

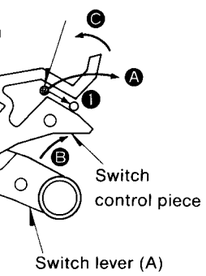
■ EXPLODED VIEW

- Cabinet and chassis parts

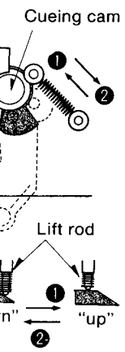


| | | |

Pin of PU board

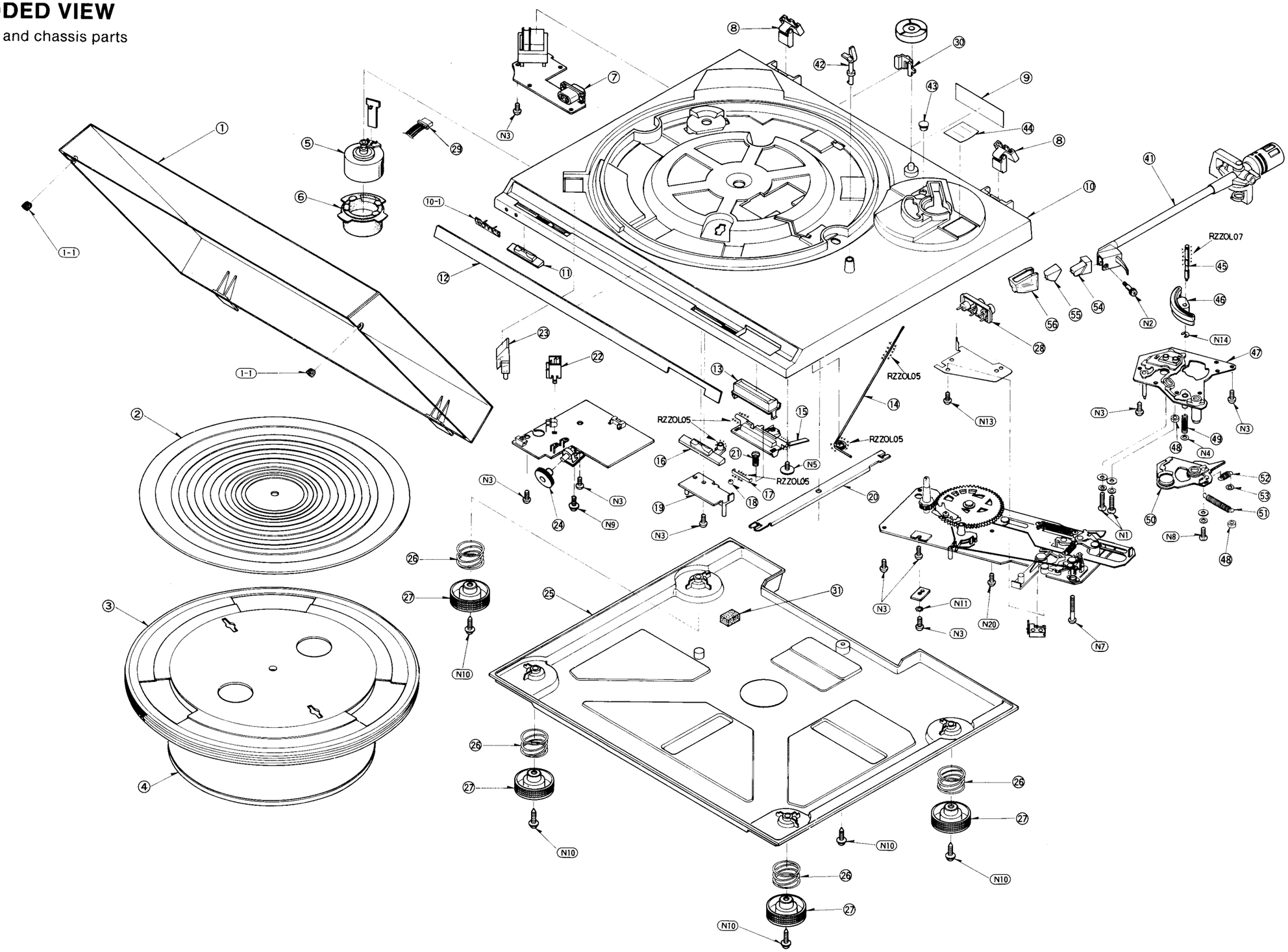


r (B) **(Fig. 1)**



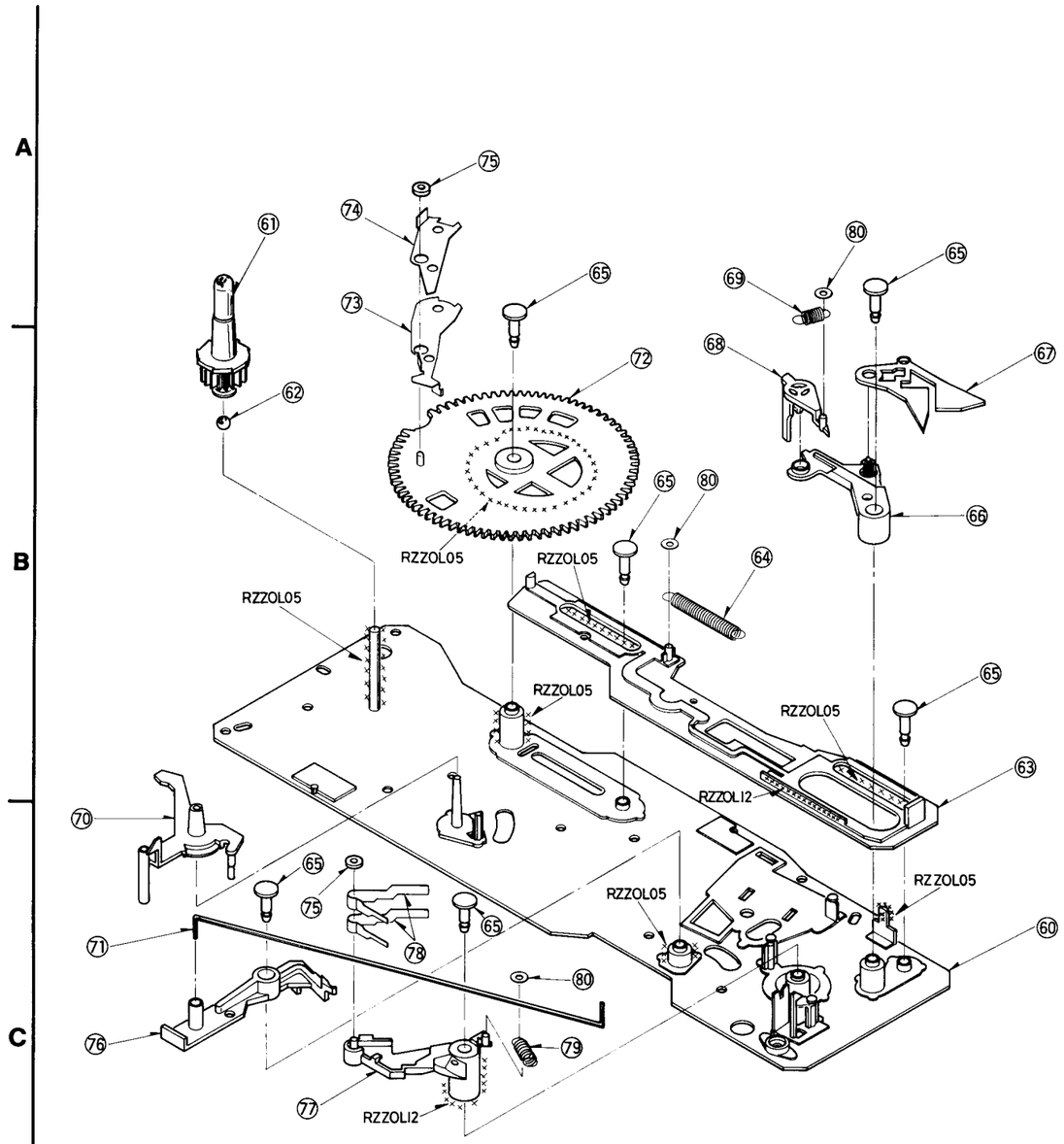
■ EXPLODED VIEW

- Cabinet and chassis parts



| | | |

• Mechanism parts



| | | |

■ REPLACEMENT PARTS LIST

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
   Components identified by a ⚠ mark have special characteristics important for safety.
   When replacing any of these components, use only manufacturer's specified parts.
3. Ⓚ-marked parts are used for black type only, while ○-marked parts are used for silver type only.
4. Parts other than Ⓚ- and ○-marked are used for both black and silver types.
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
6. The "Ⓢ" mark is service standard parts and may differ from production parts.
7. The parenthesized numbers in the column of description stand for the quantity per set.

Black type model No. SL-BD2 (K)

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	AN78L06	Regulator
IC101	SVIBA6301	Drive and Control
TRANSISTORS		
Q101	2SC1383	Switching
Q201, 202	2SB641	Strobe Drive
DIODES		
D1,2,3,4	⚠SVD1SR35200V	Rectifier
D201,202	⚠SVD1SR35200V	Rectifier
D203	MA165	Switching
D204	SVDBR5505SA	Strobe
D205	SVDBR5505SB	Strobe
D206, 207	MA165	Switching
SWITCHES		
S1	⚠SFDSD72R01	Power
S2 [XA, PA] [PE, PC] only	⚠SFDSHXW02066	Voltage Selector
S101	SFDSHSW0834	Speed Selector
VARIABLE RESISTORS		
VR101,102	EVN61AA00B24	Speed Adjustment, 20 kΩ (B)
VR103	EVJE1AF20B14	Pitch Control, 10 kΩ (B)
MAGNETIC RESISTOR ELEMENT		
Z601	EZM-BL01	F-G Detector
POWER TRANSFORMER		
T1 [EK, XL]	⚠SLT35KE61E	Power Source
T1 [PA, PE] [PC, XA]	⚠SLT35KE62E	Power Source
T1 [other]	⚠SLT35KE64E	Power Source
THERMISTER		
R110	ERTD2FFK251S	250Ω
FUSE		
F1 [XA, PA] [PE, PC] only	⚠XBAS2C005TIW	250V T50 mA
RESISTORS		
R101	ERDS2TJ152	Carbon, 1/4W, 1.5 kΩ, ±5%
R102	ERDS2TJ183	Carbon, 1/4W, 18 kΩ, ±5%
R103	ERDS2TJ682	Carbon, 1/4W, 6.8 kΩ, ±5%
R104	ERDS2TJ223	Carbon, 1/4W, 22 kΩ, ±5%
R105	ERDS2TJ272	Carbon, 1/4W, 2.7 kΩ, ±5%
R106	ERDS2TJ152	Carbon, 1/4W, 1.5 kΩ, ±5%
R107	ERDS2TJ824	Carbon, 1/4W, 820 kΩ, ±5%
R108 [XA, PA] [PE, PC]	ERDS2TJ330	Carbon, 1/4W, 33Ω, ±5%
R108 [other]	ERDS2TJ220	Carbon, 1/4W, 22Ω, ±5%
R109	ERDS2TJ220	Carbon, 1/4W, 22Ω, ±5%
R201	ERDS2TJ472	Carbon, 1/4W, 4.7 kΩ, ±5%
R202	ERDS2TJ332	Carbon, 1/4W, 3.3 kΩ, ±5%
R203	ERDS2TJ390	Carbon, 1/4W, 39Ω, ±5%
R204 [EK, XL] [XA, PA] [PE, PC]	ERDS2TJ562	Carbon, 1/4W, 5.6 kΩ, ±5%
R204 [other]	ERDS2TJ332	Carbon, 1/4W, 3.3 kΩ, ±5%
R205	ERDS2TJ102	Carbon, 1/4W, 1 kΩ, ±5%
CAPACITORS		
C1, 2, 3	⚠ECQG1223KZ	Polyester, 100V, 0.022 μF, ±10%
C4	ECEA1EU331	Electrolytic, 25V, 330 μF
C5	ECEA0JU330	Electrolytic, 6.3V, 33 μF
C101, 102	ECEA1HU010	Electrolytic, 50V, 1 μF
C103	ECQM1H473KV	Polyester, 50V, 0.047 μF, ±10%
C104	ECQP1104JZ	Polypropylene, 100V, 0.1 μF, ±5%
C105	ECQM1H103KV	Polyester, 50V, 0.01 μF, ±10%
C106	ECEA1EU3R3	Electrolytic, 25V, 3.3 μF
C107	ECEA1HU2R2	Electrolytic, 50V, 2.2 μF
C201	ECEA1HU010	Electrolytic, 50V, 1 μF
C601, 602	ECUX1H102MBM	Chip Ceramic, 50V, 0.001 μF, ±20%
CABINET AND CHASSIS PARTS		
1	SFADZ15R01E	Dust Cover (With Cushion Rubber) (1)
1-1	SFGZD04N01	Rubber Cushion, Dust Cover (2)
2	SFTGBD2N01	Turntable Mat (1)
3	SFTEBD2N01	Turntable Platter (1)
4	SFGBZ15R01	Belt (1)
5	SFMHBD2N01E	Motor (1)
6	SFUMBD2N08	Cushion Rubber, Motor (1)
7 [XL, XA] [PA, PE] [PC]	⚠SFDJHSC0509	AC Socket (1)
7 [other]	⚠SFDJHSC0515	AC Socket (1)
8	SFATZ15R01A	Hinge (2)
9 [E, EC]	SFNNBD2S01	Name Plate (1)
9 [EG]	SFNNBD2R01	Name Plate (1)
9 [EK, XL]	SFNNBD2G01	Name Plate (1)
9 [XA]	SFNNBD2X01	Name Plate (1)
9 [PA, PE]	SFNNBD2P01	Name Plate (1)
9 [PC]	SFNNBD2P02	Name Plate (1)
9 [EB, EH] [EF, Ei]	SFNNBD2Q01	Name Plate (1)
10 ○	SFACBD2N01E	Cabinet (Silver Type) (1)
10 Ⓚ	SFACBD2N21E	Cabinet (Black Type) (1)
10-1 ○	SFKBBD2N01	Badge (Silver Type) (1)
10-1 Ⓚ	SFKBBD2N21	Badge (Black Type) (1)
11	SFKTBD2N03	Knob, Speed Selector (1)
12 ○	SFKKBD2N01	Ornament Plate (Silver Type) (1)
12 Ⓚ	SFKKBD2N21	Ornament Plate (Black Type) (1)
13	SFKTBD2N01	Knob, Stop (1)
14	SFUZZ15R01	Rod, Stop Knob (1)
15	SFUMBD2N01	Base, Stop Knob (1)
16	SFKTBD2N02	Knob, Cueing (1)
17	SFQPZ15R02	Spring Plate (1)
18	SFYB-5-32	Ball (1)
19	SFUMBD2N02	Bracket, Cueing Knob (1)
20	SFUMBD2N03	Lever, Cueing (1)
21	SFQHZ15R01	Spring, Stop Knob (1)
22	SFUMBD2N06	Holder, LED (1)
23	SFUMBD2N07	Strobe (1)
24	SFKTBD2N04	Knob, Speed Adjuster (1)
25	SFAUBD2N01	Bottom Cover (1)
26	SFQCBD2N01	Spring, Insulator (4)
27	SFGABD2N01	Insulator (4)
28	SFDJBD2N01	Jack, Output (1)
29	SFDJBD2N02E	Connector Ass'y (5P) (1)
30 Except for [PA, PE] [PC, XA]	SFACBD2N011	Cover (1)
31	SFNUZBD2N01	Rubber Cushion (1)
TONEARM PARTS		
41 ○	SFPAMBD201A	Tonearm (Silver Type) (1)
41 Ⓚ	SFPAMBD202A	Tonearm (Black Type) (1)
42	SFKUZ15R01	Tonearm Rest (1)
43 ○	SFGK170-01	Cap (Silver Type) (1)
43 Ⓚ	SFGK171F01	Cap (Black Type) (1)
44	SFKKBD2N02	Plate, Canceller (1)
45	SFXJBD2N51	Shaft, Arm Lift (1)
46	SFUMBD2N51	Arm Lift (1)
47	SFUPBD2N51E	Arm Base (1)
48	SFGZZ15R02	Cap (2)
49	SFQAZ15R53	Spring (1)
50	SFUPBD2N52E	Plate, Pick-up Mounting (1)
51	SFQHZ15R55	Spring (1)
52	SFQHZ15R51	Spring (1)
53	SFUMZ15R57	Stopper (1)
54 [PA, PE] [PC]	EPC-P28S	★Cartridge (1)
54 [other]	EPC-P30S	★Cartridge (1)
55 [PA, PE] [PC]	EPC-28CS	★Stylus (1)
55 [other]	EPC-30CS	★Stylus (1)
56 [PA, PE] [PC]	SFCNC05101	Cover, Stylus (1)
56 [other]	SFCNC03301	Cover, Stylus (1)
AUTOMATIC MECHANISM PARTS		
60	SFUKBD2N51E	Mechanism Plate (1)
61	SFTUN05N02A	Turntable Shaft (1)
62	SFYB-5-32	Ball (1)
63	SFUBZ15R51	Plate, Drive (1)
64	SFQHZ15R54	Spring, Drive Plate (1)
65	SFUMZ15R56	Pin (5)
66	SFUMZ15R54	Switch Lever (A) (1)
67	SFUMZ15R59	Switch Lever (B) (1)
68	SFUMZ15R55	Switch Lever (C) (1)
69	SFQHZ15R52	Spring (1)
70	SFUMZ15R52	Lever, Actuating (1)
71	SFQSZ15R51	Rod, Actuating (1)
72	SFUGZ15R51	Main Gear (1)
73	SFURZ15R52	Link, Main Gear (A) (1)
74	SFURZ15R51	Link, Main Gear (B) (1)
75	SFUMZ15R61	Washer (1)
76	SFUMZ15R51	Lever, Cueing (1)
77	SFUMZ15R60	Cam, Cueing (1)
78	SFQPZ15R53	Spring Plate (2)
79	SFQHZ15R56	Spring Cueing (1)
80	SFXWZ15R51	Washer (3)
SCREWS AND WASHERS		
N1	XYN3+F12	Screw, ⊕3×12 (2)
N2	SFPEV0Q601	Screw, Cartridge (1)
N3	XTV3+8G	Screw, ⊕3×8 (9)
N4	SFXWZ15R51	Washer (1)
N5	SFXGQ06N02	Screw (1)
N7	XTV3+30J	Screw, ⊕3×30 (1)
N8	SFXGQ34N02	Screw (1)
N9	XTW3+10Q	Screw, ⊕3×10 (1)
N10	XTW3+14QFYR	Screw, ⊕3×14 (5)
N11	XWC3B	Washer, φ3 (1)
N12	XYE3+EJ8	Screw, ⊕3×8 (1)
N13	XTV3+16BFZ	Screw, ⊕3×16 (1)
N14	XUC3FY	Washer, φ3 (1)
ACCESSORIES		
A1 [E, EH] [EB, EC]	SFNUBD2S01	Instruction Book (1)
A1 [EK]	SFNUBD2G01	Instruction Book (1)
A1 [XL, XA]	SFNUBD2X01	Instruction Book (1)
A1 [EG]	SFNUBD2R01	Instruction Book (1)
A1 [PA, PE] [PC]	SFNUBD2P01	Instruction Book (1)
A1 [EF]	SFNUBD2F01	Instruction Book (1)
A1 [Ei]	SFNUBD2I01	Instruction Book (1)
A2	SFDHBD2N01	Output Cord (1)
A3	SFDLJ02N11E	Ground Wire (1)
A4	SFWE212-01	45 Adaptor (1)
A5 [XL]	⚠SFDAC05L01	AC Cord (1)
A5 [EK]	⚠SFDAC05G02	AC Cord (1)
A5 [XA]	⚠SFDAC05X02	AC Cord (1)
A5 [PA, PE] [PC]	⚠SFDAC05N01	AC Cord (1)
A5 [other]	⚠SFDAC05E02	AC Cord (1)
A6 [XA] only	⚠SFDKI19118	Plug (1)
A7 [PA, PE] [PC] only	⚠QJP0603S	Adaptor (1)
PACKING PARTS		
P1 [EF] ○	SFHPBD2C01	Carton Box (Silver Type) (1)
P1 [other] ○	SFHPBD2M01	Carton Box (Silver Type) (1)
P1 [EF] Ⓚ	SFHPBD2F21	Carton Box (Black Type) (1)
P1 [other] Ⓚ	SFHPBD2M21	Carton Box (Black Type) (1)
P2	SFHHBD2N01	Pad, Left (1)
P3	SFHHBD2N02	Pad, Right (1)
P4	SFHKBD2N01	Clamper, Turntable (2)
P5	SFHZBD2N01	Clamper, Tonearm (Back) (1)
P6	SFHZZ15R03	Clamper, Tonearm (1)
P7	SFHZZ15R02	Clamper, Cord (1)
P8	SFYP75A45	Polyethylene Sheet (1)
P9	SFYH60×60	Polyethylene Bag, Unit (1)
P10	SFYH52×50	Polyethylene Bag, Dust Cover (1)
P11	SFYH17×16	Polyethylene Bag, Cord (1)
P12	SFYF05A06	Polyethylene Bag, 45 Adaptor (1)
P13	SFHZQ63M01	Pad, Weight (1)

Printed in Japan
850407000 Ⓢ AM/HY

ORDER NO. HAD85032436C9-A

Turntable System

SL-BD2

- This booklet includes the specifications and adjustment of Model SL-BD2 (Order No. HAD85032436C9) written in German, French and Spanish.
- File this booklet together with the service manual of Model SL-BD2.

- Dieses Büchlein umfaßt die technischen Daten und Justierungsanleitungen von Modell SL-BD2 (Bestell Nr. HAD85032436C9) in den Sprachen Deutsch, Französisch und Spanisch.
- Bewahren Sie dieses Büchlein zusammen mit dem Service-Handbuch von Modell SL-BD2.

- Cette brochure comprend les spécifications et la mise au point du Modèle SL-BD2 (N° d'Ordre HAD85032436C9) écrites en allemand, en francais et en espagnol.
- Classer cette brochure en même temps qu'avec le manuel de service du Modèle SL-BD2.

- Este librito incluye las especificaciones y ajuste de Modelo SL-BD2 (Pedido N° HAD85032436C9) escritas en alemán, francés y español.
- Guardar este librito juntamente con el manual servicio de Modelo SL-BD2.

DEUTSCH

■ TECHNISCHE DATEN (Spezifikationen Können infolge von Verbesserungen ohne Ankündigung geändert werden.)

■ Plattenspieler

Typ:	Automatischer Plattenspieler Rückführautomatik Stopautomatik
Antrieb:	Riemenantrieb
Motor:	Gleichstrommotor
Antriebsregel-Methode:	Gleichstrom-Servo-Steuerung
Plattenteller:	Aluminium-Spritzguß Durchmesser 31,2 cm
Plattenteller-Drehzahlen:	33-1/3 und 45 U/min
Gleichlaufschwankungen:	0,045% WRMS (JIS C5521) ±0,06% Spitze (IEC 98A bewertet)
Rumpel-Geräusch-spannungsabstand:	−70 dB (IEC 98A bewertet)

■ Tonarm

Typ:	Statisch balancierter, gerader Tonarm Tonabnehmersystem vom Einsteck-Typ
Effektive Länge:	230 mm
Überhang:	15 mm
Spurfehlwinkel:	2°32' bei der Einlaufrille einer 30 cm-Platte 0°32' bei der Auslaufrille einer 30 cm-Platte
Effektive Masse:	13,5 g (einschließlich Tonabnehmer)
Auflagekraft-Einstellbereich:	1,25 g
Zulässiger Tonabnehmer-Gewichtbereich:	6 g

■ Tonabnehmer

Typ:	Stereo-Magnet-Tonabnehmer mit Einpunkt-Aufhängungssystem
Magnetkreis:	Ganzlamellenkern
Frequenzgang:	10 Hz bis 35 kHz
Ausgangsspannung:	2,5 mV bei 1 kHz 5 cm/s. Null-zu-Spite, lateral [7 mV bei 1 kHz 10 cm/s. Null-zu-Spite, 45° (DIN 45 500)]
Kanaltrennung:	22 dB bei 1 kHz
Kanalabweichung:	Innerhalb 2 dB bei 1 kHz
Empfohlene Endimpedanz:	47 kΩ~100kΩ
Nachgiebigkeit (dynamisch):	12×10^{-6}cm/dyn bei 100 Hz
Auflagekraft-Einstellbereich:	1,25±0,25 g (12,5±2,5 mN)
Gewicht:	6 g (nur Tonabnehmer)
Ersatznadel:	EPS-30CS

■ Allgemeine Daten

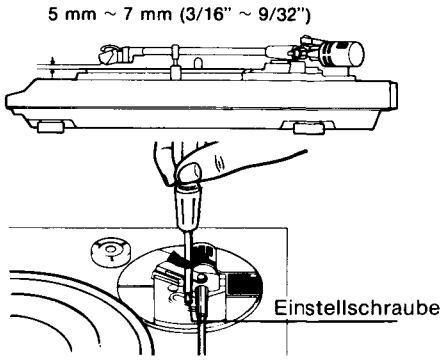
Stromversorgung:	220V, 50 Hz Wechselstrom
Leistungsaufnahme:	3 W
Abmessungen (B×H×T):	43 × 9,3 × 37,5 cm Maximale Höhe bei geöffnetem Oberteil (Staubabdeckung). 43 × 36 × 41 cm
Gewicht:	3,6 kg

■ MESSUNGEN UND JUSTIERUNGEN

• Justierung der Tonarmlifthöhe

Die Tonarmlifthöhe, d.h. der Abstand zwischen Nadelspitze und Schallplattenoberfläche bei Liftsteuerungs-Position "▽", wurde werkseitig auf ca. 5—7 mm eingestellt. Falls der Abstand zu groß oder zu klein ist, drehen Sie die Justierschraube im Uhrzeigersinn oder entgegen dem Uhrzeigersinn.

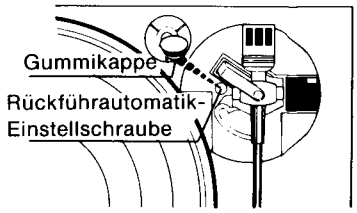
Drehung im Uhrzeigersinn
—Der Abstand zwischen der Platte und der Nadelspitze wird kleiner.
Drehung entgegen dem Uhrzeigersinn
—Der Abstand zwischen der Platte und der Nadelspitze wird größer.



• Justierung des Abschaltpunktes der Automatik

1. Setzen Sie zuerst den Nadelschutz auf.
2. Die Gummikappe abnehmen.
3. Führen Sie den Tonarm gegen die Plattenmitte.
   Die Justierschraube für den Abschaltpunkt der Automatik wird dann sichtbar.

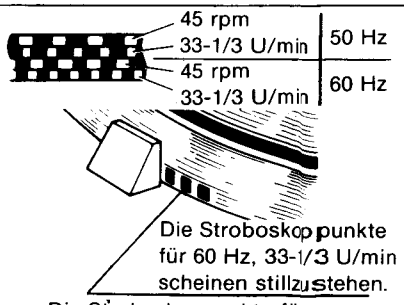
Falls der Tonarm zu früch zurückkehrt:
—Entgegen dem Uhrzeigersinn drehen.
Falls der Tonarm nach Erreichen der Auslaufrille nicht zurückkehrt:
—Im Uhrzeigersinn drehen.



• Drehzahl-Feineinstellung (Tonhöhe-Regelung)

Am Plattenteller sind Stroboskoppunkte eingefrast, die zur Anzeige der korrekten Drehzahl dienen.
Wenn die Stroboskoppunkte bei der Drehung des Plattentellers zu fließen scheinen, regeln Sie während des Abspielens einer Schallplatte.

1. Stellen Sie den Drehzahl-Wahlschalter auf die zu regulierende Drehzahl ein.
2. Betrachten Sie das Punktemuster an der Seite des Plattentellers. Drehen Sie den Drehzahl-Feineinsteller links- oder rechtsherum, bis die Punkte stillzustehen scheinen. Dieser Zustand stellt die korrekte Drehzahl dar.
3. Durch Drehen des Drehzahl-Feineinstellers in der "+"-Richtung wird die Drehzahl erhöht.
4. Durch Drehen des Drehzahl-Feineinstellers in der "—"-Richtung wird die Drehzahl verringert.



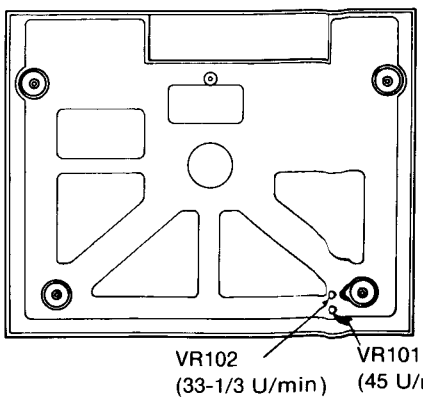
Die Stroboskoppunkte für 50 Hz sind für Europa; die Stroboskoppunkte für 60 Hz sind für den Betrieb in den U.S.A. und Kanada.

• Drehzahl

Wenn das Plattenteller-Antriebs-/Regel-IC (IC101) oder der Drehwiderstand (VR101, 102) ausgetauscht wird, oder wenn die Nenndrehzahl auch durch Drehen Drehzahlreglers nicht erreicht werden kann, so ist die Drehzahl auf folgende Weise zu justieren.

1. Den Drehzahl-Wahlschalter in die "45"-Position stellen.
2. VR101 von der Unterseite des Gerätes her mit einem Schraubendreher auf die Nenndrehzahl (45 U/min) drehen und die Drehzahl während der Justierung mit einem Stroboskop prüfen.
3. Den Drehzahl-Wahlschalter in die "33"-Position stellen.
4. VR101 von der Unterseite des Gerätes her mit einem Schraubendreher auf die Nenndrehzahl (33 U/min) drehen und die Drehzahl während der Justierung mit einem Stroboskop prüfen.

Anmerkung: Die Justierung für 45 U/min muß unbedingt zuerst durchgeführt werden.



FRANÇAIS

■ CARACTERISTIQUES (Sujet à changement sans prearis.)

■ Platine de lecture

Type:	Platine automatique Retour automatique Arrêt automatique
Système d'entraine-ment:	Entraînement par courroie
Moteur:	Moteur C.C.
Groupe de réglage:	Servocommande du générateur de fréquences
Plateau de lecture:	En aluminium moulé sous pression Diamètre 31,2 cm
Vitesses de rotation:	33-1/3 et 45 t/p.m.
Pleurage et scintille-ment:	0,045% de valeur efficace (JIS C5521) ±0,06% de crête (IEC 98A Pondéré)
Ronflement:	−70 dB (IEC 98A Pondéré)

■ Bras de lecture

Type:	Bras de lecture rectiligne statiquement équilibré Système de cellule de lecture à connecteur enfichable
Longueur effective:	230 mm
Porte-à-faux:	15 mm
Angle d'erreur de piste:	En deçà de 2°32' au sillon extérieur d'un disque de 30 cm En deçà de 0°32' au sillon intérieur d'un disque de 30 cm
Masse réelle:	13,5 g (y compris la cellule pick-up)
Force verticale d'appui:	1,25 g (Fixé)
Poids des cellules pick-up utilisables:	6 g
Capacitance du câble phono:	90 pF

■ Cellule pick-up

Type:	Cellule pick-up stéréo à aimant mobile
Circuit magnétique:	Noyau entièrement feuilleté
Réponse en fréquence:	10 Hz à 35 kHz
Tension de sortie:	2,5 mV à 1kHz; 5 cm/s., zéro à vitesse latérale de crête (7 mV à 1 kHz 10 cm/s., zéro à vitesse 45° de crête [DIN 45 500])
Séparation des canaux:	22 dB à 1 kHz
Equilibrage des canaux:	En deçà de 2 dB à 1 kHz
Impédance de charge recommandée:	47 kΩ~100 kΩ
Elasticité (dynamique):	12×10^{-6}cm/dyne à 100 Hz
Plage de la force verticale d'appui:	1,25 ±0,25 g (12,5 ±2,5 mN)
Poids:	6 g (cellule seule)
Pointe de lecture de remplacement:	EPS-30CS

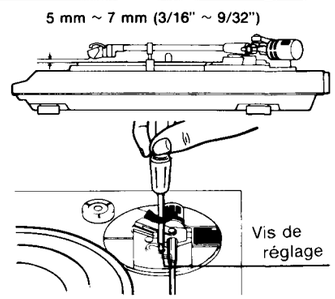
■ Généralités

Alimentation:	Alternatif 110—127/220—240 V, 50 ou 60 Hz
Consommation:	3 W
Dimensions: (L×H×P)	43 × 9,3 × 37,5 cm Hauteur maximum lorsque le couvercle protège-poussière est ouvert 43 × 36 × 41 cm
Poids:	3,6 kg

■ MESURAGES ET REGLAGES

• Mise au point de la hauteur de l'élévateur du bras

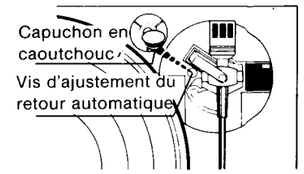
La hauteur de l'élévateur du bras (distance entre l'extrémité de la pointe de lecture et la surface du disque, lorsque la commande de pose et de relevage est à la position "▽") a été réglée en usine sur approximativement 5 à 7 mm.
Si l'écartement est trop étroit ou trop large, tourner la vis de réglage dans le sens des aiguilles d'une montre ou dans le sens contraire.
Rotation dans le sens des aiguilles d'une montre.
—La distance entre la surface du disque et l'extrémité de la pointe de lecture diminue.
Rotation dans le sens contraire des aiguilles d'une montre.
—La distance entre la surface du disque et l'extrémité de la pointe de lecture augmente.



• Mise au point de la position de retour automatique

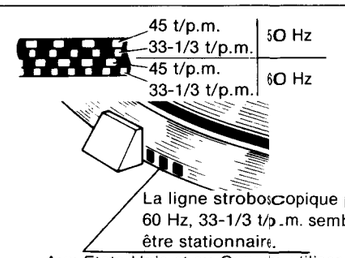
1. Bloquer le bras de lecture sur le support du bras.
2. Retirer le capuchon en caoutchouc.
3. Avec un tournevis, tourner la vis de réglage dans le sens des aiguilles d'une montre ou dans le sens inverse selon la nécessité.

Si le bras de lecture tend à revenir vers le support du bras avant que l'audition ne soit terminée,
—tourner dans le sens contraire des aiguilles d'une montre.
Si le bras de lecture ne peut revenir en arrière après le dernier sillon,
—tourner dans le sens des aiguilles d'une montre.



• Réglage de la vitesse (commande d'écart)

Il y a des lignes stroboscopiques sur ce plateau de tournedisque pour indiquer la vitesse rotationnelle correcte.
Si la ligne stroboscopique semble se déplacer dès que la platine tourne, ajuster en faisant jouer un disque.
1. Régler le sélecteur de vitesse sur la vitesse devant être mise au point.
2. Observer l'image des points sur le côté du plateau. Tourner la commande d'écart dans un sens ou dans l'autre jusqu'à ce que les points apparaissent immobiles. Cela représentera la vitesse exacte.
3. En tournant la commande d'écart dans la direction "+" on augmente la vitesse.
4. En tournant la commande d'écart dans la direction "−" on diminue la vitesse.

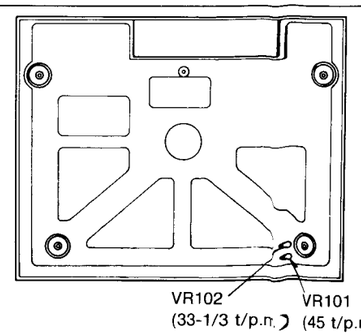


Aux Etats-Unis et au Canada utiliser des lignes de 60 Hz.
Les lignes de 50 Hz sont pour les pays européens.

• Vitesse de rotation

Lorsque le circuit intégré (IC101) de commande/dispositif d'entraînement de la platin ou les résistances variables (VR101, 102) sont changés, ou si la rotation nominale n'est pas atteinte même lorsque la manette de réglage d'écart est tournée, ajuster la vitese de rotation selon la procédure suivante.
1. Régler le commutateur-sélecteur de vitesse sur la position "45".
2. Tourner VR101 avec un tournevis à partir de la face inférieure de l'appareil sur la rotation nominale (45 t/p.m.) et vérifier la rotation avec un stroboscope tout en réglant la vitesse.
3. Régler le commutateur-sélecteur de vitesse sur la position "33".
4. Tourner VR102 avec un tournevis à partir de la face inférieure de l'appareit sur la rotation nominale ((33-1/3 t/p.m.) et vérifier la rotation avec un stroboscope tout en réglant la vitesse.

Nota: S'assurer d'effectuer tout d'abord le réglage pour 45 t/p.m.



ESPAÑOL

■ ESPECIFICACIONES (Estas especificaciones están sujetas a cualquier cambio sin previo eviso.)

■ Sección del plato giratorio

Tipo:	Plato giratorio automático Retorno automático Parada automática
Método de accionamiento:	Accionamiento por correa
Motor:	Motor de corriente continua
Método de control de accionamiento:	Servocontrol por generador de frecuencias
Platillo del plato giratorio:	Aluminio fundido Diámetro 31,2 cm
Velocidades del plato giratorio:	33-1/3 y 45 rpm
Ululaciones y trémolo:	0,045% WRMS (JIS C5521) ±0,06% cresta (IEC 98A Ponderado)
Ruido de rodadura:	−70 dB (IEC 98A Ponderado)

■ Sección del brazo sonoro

Tipo:	Brazo sonoro recto equilibrado estáticamente Sistema de cartucho con conector enchufable
Longitud efectiva:	230 mm
Proyección:	15 mm
Angulo de error de seguimiento:	Inferior a 2°32' en el surco exterior de un disco de 30 cm Inferior a 0°32' en el surco interior de un disco de 30 cm
Masa efectiva:	13,5 g (incluyendo el cartucho)
Presión de la aguja:	1,25 g (Fijo)
Peso de cartucho utilizable:	6 g
Capitancia del cable del fonógrafo:	90 pF

■ Sección del cartucho

Tipo:	Cartucho estereofónico de imán móvil
Circuito magnético:	Núcleo totalmente laminado
Respuesta de frecuencia:	10 Hz a 35 kHz
Voltaje de salida:	2,5 mV a 1 kHz Con velocidad lateral de cero a cresta de 5 cm/s [7 mV a 1 kHz Velocidad de 45° de cero a cresta de 10 cm/s (DIN 45 500)]
Separación de canales:	22 dB a 1 kHz
Equilibrio de canales:	Sin exceder 2 dB a 1 kHz
Impedancia de carga recomendada:	47 kΩ a 100 kΩ
Elasticidad (dinámica):	12×10^{-6} cm/dina a 100 Hz
Radio de presión de la aguja:	1,25 ±0,25 g (12,5 ±2,5 mN)
Peso:	6 g (cartucho sólo)
Aguja de recambio:	EPS-30CS

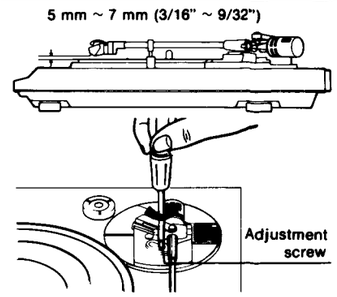
■ En general

Alimentación de corriente:	~110—127/220—240V, 50 ó 60 Hz
Consumo de corriente:	3 W
Dimensiones: (Ancho×Alto×Prof.)	43 × 9,3 × 37,5 cm (Altura máxima cuando la parte de arriba (tapa contra el polvo) está abierta. 43 × 36 × 41 cm
Peso:	3,6 kg

■ MEDICIONES Y AJUSTE

• Ajuste de la altura de elevación del brazo

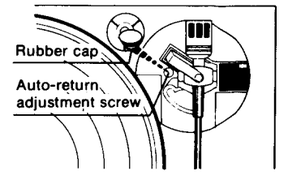
La altura de elevación del brazo (o sea, la distancia entre la punta de la aguja y la superficie del disco cuando el control de colocación está en la posición "▽") ha sido regulada en la fábrica aproximadamente entre 5 y 7 mm.
En caso que la distancia fuese demasiado abundante o demasiado escasa, girar el tornillo de ajuste hacia la derecha o hacia la izquierda.
Rotación hacia la derecha
—reduce la distancia entre el disco y la punta de la aguja.
Rotación hacia la izquierda
—aumenta la distancia entre el disco y la punta de la aguja.



• Ajuste de la posición para retorno automático

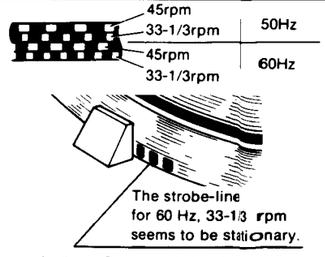
En caso que la aguja no se depositara en el surco de comienzo, regular de la manera que sigue.
1. Sujetar el brazo sonoro al apoyo del mismo con la grapa.
2. Quitar la tapita de goma.
3. Girar el tornillito de ajuste hacia la derecha o hacia la izquierda usando un destornillador, según sea necesario.

Quando el brazo sonoro tienda a volver a su apoyo antes de terminar la ejecución:
—Girar hacia la izquierda.
En caso que el brazo sonoro no vuelva después de haber tocado el útimo surco del disco:
—Girar hacia la derecha.



• Ajuste de la velocidad (control de altura del sonido)

En el platillo de este plato giratorio hay talladas líneas estroboscópicas para indicar la velocidad de rotación correcta. Si la línea estroboscópica aparenta moverse en la dirección en que lo hace el plato giratorio, ajustar mientras se toca un disco.
1. Poner el selector de velocidad a la velocidad a la que habrá de ser ajustado.
2. Mirar el patrón de puntos del lado del platillo.
   Girar el control de altura de sonido en cualquiera de los sentidos hasta que los puntos den la sensación de no moverse. Ésta será la velocidad correcta.
3. Girando el control de altura de sonido en el sentido "+", la velocidad aumenta.
4. Girando el control de altura de sonido en el sentido "−", la velocidad disminuye.

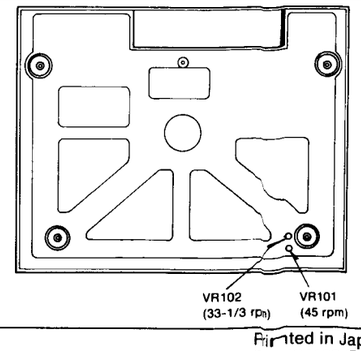


In the U.S.A. and CANADA use 60 Hz lines.
The 50 Hz lines are for European countries.

• Velocidad giratoria

Cuando el CI (IC101) de accionamiento/control del plato giradiscos o los resistores variables (VR101, 102) son cambiados, o si la rotación nominal no es alacanzada, aun cuando la perila de control del paso es girada, ajuste la velocidad giratoria con el siguiente procedimiento.
1. Ponga el interruptor selector de velocidad en la posición "45".
2. Gire VR101 con un destornillador desde la parte inferior del aparato a la velocidad nominal (45 rpm) y compruebe la rotación con un estroboscopio mientras ajusta la velocidad.
3. Ponga el interruptor selector de velocidad en la posición "33".
4. Gire VR102 con un destornillador desde la parte inferior del aparato a la rotación nominal (33-1/3 rpm) y compruebe la rotación con un estroboscopio mientras ajusta la velocidad.

Nota: Asegúrese de hacer el ajuste para 45 rpm primero.



Printed in Japan
8J0-405100 Ⓢ AM